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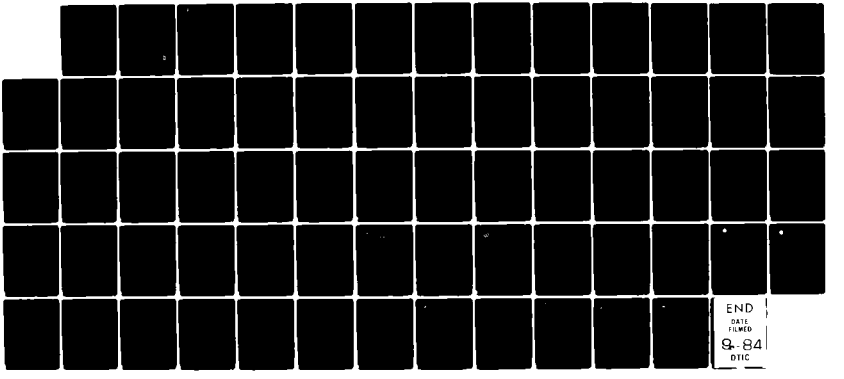

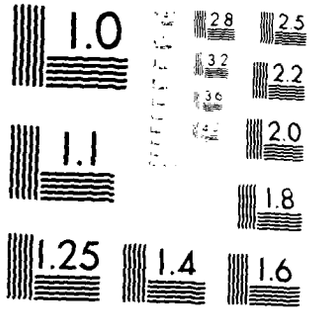

REPORT BY THE U.S.

General Accounting Office

Federal Agencies' Actions To Implement Section 11 Of The Stevenson-Wydler Technology Innovation Act Of 1980

The purpose of Section 11 of the Stevenson-Wydler Act is to encourage transfer of the results of federally funded research and development to state and local governments and the private sector. The act directs each agency to establish an appropriate organizational structure, set aside a small portion of its research and development budget for technology transfer, and provide staff to accomplish the act's objectives.

GAO found that most of the agencies and their laboratories have taken action to implement the requirements of the act. GAO also found that patent policies and lack of resources to perform technical assistance may hamper technology transfer efforts.

GAO/RCED-84-60
AUGUST 24, 1984

UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

RESOURCES, COMMUNITY,
AND ECONOMIC DEVELOPMENT
DIVISION

B-214748

The Honorable Charles McC. Mathias, Jr.
Chairman, Subcommittee on Governmental
Efficiency and the District of Columbia
Committee on Governmental Affairs
United States Senate

The Honorable George E. Brown, Jr.
Chairman, Subcommittee on Departmental Operations,
Research and Foreign Agriculture
Committee on Agriculture
House of Representatives

The Honorable Doug Walgren
Chairman, Subcommittee on Science, Research and
Technology
Committee on Science and Technology
House of Representatives

Your joint letters of December 8, 1981, and May 25, 1982, asked us to review the implementation of Section 11 of the Stevenson-Wydler Technology Innovation Act of 1980 in 10 federal agencies.[1] Section 11 of the act requires each applicable federal laboratory to

--establish an Office of Research and Technology Applications (ORTA);

--assign one full-time professional employee for the ORTA in laboratories[2] with an annual budget over $20 million; and

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[1]Federal agencies in our survey include: Department of Agriculture (USDA), Department of Commerce (DOC), Department of Defense (DOD), Department of Energy (DOE), Department of Health and Human Services (HHS), Department of the Interior (DOI), Department of Transportation (DOT), Environmental Protection Agency (EPA), National Aeronautics and Space Administration (NASA), and National Science Foundation (NSF).

[2]The act defines a federal laboratory as any laboratory, any federally funded research and development center, or any center established under this act that is owned and funded by the federal government, whether operated by the government or by a contractor.

--set aside 0.5 percent of the research and development (R&D) budget for technology transfer functions, such as providing technical assistance to state and local governments, assessing R&D projects with potential for commercial and public uses, disseminating new technological information, and cooperating with organizations which link R&D resources to potential users in state and local governments and private industry.

Your letters requested that we (1) survey the agencies and their laboratories to determine their compliance with the above requirements, (2) identify any problems the agencies were experiencing in implementing these requirements, and (3) provide a list of laboratories operated by each agency.

To address your request, we interviewed top-level officials in the 10 federal agencies you suggested we review and sent a questionnaire to the directors of the 236 laboratories owned and/or funded by those agencies.

FEDERAL AGENCIES HAVE TAKEN ACTION TO IMPLEMENT SECTION 11 OF THE ACT

For the most part, we found that federal agencies and their laboratories have taken action to implement Section 11 of the Stevenson-Wydler Act. For example, we found that:

--All of the agencies have issued guidelines and policy statements for their laboratories to implement section 11 of the law.

--Eighty-one percent (190 of 236) of the federal laboratories are covered by an ORTA. Some of the reasons given by the 46 laboratories that have not established an ORTA include (1) personnel limitations, (2) uncertainty about agency policies on establishing an ORTA, and (3) function performed by another unit within the agency.

--All 70 laboratories with an annual budget in excess of $20 million either have a full-time staff for the ORTA or have appropriately requested a waiver of this provision.

--All of the agencies indicated that they had spent more than 0.5 percent of their fiscal year 1982 R&D budget on technology transfer functions. However, we could not determine a precise amount spent on technology transfer activities because agencies do not account for these activities separately.

According to the legislation, the ORTA's technology transfer functions are to (1) prepare a technology application assessment of R&D projects with potential for successful application to the public or private sector, (2) provide and disseminate information on federally owned or originated products, processes, and services having potential application to the public or private sector, (3) provide technical assistance in response to requests from state and local governments, and (4) cooperate with and assist the Department of Commerce's Center for the Utilization of Federal Technology (CUFT) and other organizations which link that laboratory and the federal government to potential users. Of the above functions, we found that technological information dissemination was the primary function being performed by the ORTAs. For example, over half of the fiscal year 1982 funds available to the laboratory ORTAs was estimated to have been spent on information dissemination.

We found that federal laboratories which are covered by an ORTA show a higher level of technology transfer activities than laboratories without an ORTA. However, the higher level of activity in the ORTA laboratories could be attributed to the fact that (1) the laboratories with ORTAs have more resources than those without and (2) the research results of the smaller non-ORTA laboratories may not be conducive to outside applications. (See table 5, p. 10, app. I, for a profile of ORTA versus non-ORTA laboratories.)

ISSUES WHICH MAY HAMPER TECHNOLOGY TRANSFER

Agency officials identified two issues which may hamper technology transfer efforts: (1) the lack of resources for providing technical assistance to state and local governments and (2) barriers created by some agencies' federal patent policies.

Officials at DOD, DOC, EPA, and DOI noted that technology developed for federal purposes often requires engineering changes to make it suitable for application by state and local governments. Some federal laboratories do not have the resources necessary to provide the level of technical assistance needed by state and local governments. These officials also noted that state and local governments often do not have the necessary resources to do the adaptive engineering. This lack of resources in both the laboratories and in state and local governments may hamper technology transfer.

Officials at the Department of Commerce who met with the departments and agencies that were required to implement the law, told us that certain patent and licensing policies and procedures at some agencies may be barriers to transferring technologies developed with federal funds. For example, DOC officials noted that some agencies will not grant exclusive license in cases where more than one firm applies for a license. Without exclusive licenses, firms may be unable to protect their development

investments in potentially attractive new technologies. Therefore, without exclusive licenses, firms may be unwilling to make the required investment to commercialize federal technologies. Public Law 96-517 may ameliorate this barrier to technology transfer because it provides federal agencies the authority to give first preference to exclusive license to small firms.

AGENCY COMMENTS AND GAO RESPONSE

All 10 agencies included in this study reviewed and commented on a draft of this report. With the exception of NASA, NSF and EPA, the agencies generally agreed with our findings. At the recommendation of several agencies, GAO made changes to clarify the presentation of tabular information in the report. (The agency comments and our responses are included in apps. IV through XIII.)

NASA had several concerns about this report. Among them were NASA's contention that the two issues of technical assistance and patent policies did not pertain to NASA's laboratories. We note that although they may not apply to NASA, officials of several other agencies stated these two issues may hinder technology transfer. NASA also was concerned over pressure to create uniform agency approaches to technology transfer. We do not believe the Stevenson-Wydler Act was intended to threaten existing agency technology transfer efforts--we found NASA's program in full compliance. (See app. IV for NASA's complete concerns and our responses.)

NSF noted that its laboratories may have been confused in interpreting the GAO questionnaire, while EPA indicated different statistics at EPA headquarters than those reported to us by EPA's laboratories. We believe that the comments from NSF and EPA may reflect either the differences in the status of implementation between the time we surveyed federal laboratories and the present or the differences in perspective on implementation of the act between the headquarters and their laboratories. (NSF's and EPA's specific comments and our responses are contained in apps. V and VI,respectively.)

Appendix I discusses the implementation of section 11 and related issues in more detail. Appendix II is a list of the laboratories owned and/or funded by the agencies in this review. Appendix III is the questionnaire used to survey these federal laboratories.

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Copies of this report are being sent to the heads of the 10 agencies in our review; the Director, Office of Management and Budget; and the Director, Office of Science and Technology Policy.

J. Dexter Peach
Director

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ABBREVIATIONS

DOC	Department of Commerce
DOD	Department of Defense
DOE	Department of Energy
DOI	Department of the Interior
DOT	Department of Transportation
EPA	Environmental Protection Agency
GAO	General Accounting Office
HHS	Department of Health and Human Services
NASA	National Aeronautics and Space Administration
NSF	National Science Foundation
ORTA	Office of Research and Technology Applications
R&D	research and development
USDA	Department of Agriculture

STATUS OF AGENCIES' EFFORTS TO IMPLEMENT SECTION 11 OF THE STEVENSON-WYDLER ACT

BACKGROUND

The U.S. Congress has increased its interest in industrial technology and innovation and productivity issues in the past years. The passage of the Stevenson-Wydler Act of 1980 is one such action designed to promote technological innovation for the achievement of national economic, environmental, and social goals. Section 11 of the act, entitled "Utilization of Federal Technology," sets forth the policy to ensure full use of the results of the nation's federal investment in research and development (R&D). It provides the authority to establish offices in federal agencies and their laboratories to transfer federally owned technologies to state and local governments and to the private sector. More specifically, the act requires that each applicable federal laboratory (1) establish an Office of Research and Technology Application (ORTA), (2) assign a full-time staff to the ORTA in each laboratory[1] with an annual budget in excess of $20 million, and (3) set aside 0.5 percent of each agency's R&D budget for technology transfer functions (described in next paragraph).

The legislation also requires that each ORTA or equivalent organization[2] perform the following functions:

1. Assess each R&D project which has potential for use by state and local governments or private industry.

2. Provide and disseminate information about federally owned or originated products, processes, and services to state and local governments and to private industry.

3. Provide technical assistance in response to requests by state and local governments.

4. Cooperate with organizations which link federal R&D resources to potential users in state and local governments and private industry.

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[1]The act defines a federal laboratory as any laboratory, any federally funded R&D center, or any center established under this act that is owned and funded by the federal government, whether operated by the government or by a contractor.

[2]The act permits an agency that has designated an organization outside the laboratory or outside the agency to continue to perform the technology transfer functions required by the act. For example, NASA uses contractors to identify potential clients for NASA technologies and to facilitate transfer of NASA technologies.

The total fiscal year 1982 R&D budget for the 10 agencies in our survey[3] was estimated to be about $35.5 billion. Based on the 0.5 percent set-aside requirement, we estimate that in fiscal year 1982, these agencies were required to provide $177 million to support technology transfer functions.

OBJECTIVES, SCOPE, AND METHODOLOGY

We were requested[4] to (1) survey the agencies and their laboratories to determine their compliance with the above requirements, (2) identify any problems the agencies were experiencing in implementing these requirements, and (3) provide a list of federal laboratories operated by each agency.

Our study focused primarily on the activities that the federal agencies and their laboratories took to implement Section 11 of the Stevenson-Wydler Act. We also compared the technology transfer activities of ORTA laboratories versus non-ORTA laboratories. We did not review the effectiveness of section 11 in enhancing technology transfer.

We interviewed senior officials in the 10 federal agencies to determine their efforts to implement the act and to address other requestors' concerns. We also sent a questionnaire to the directors of all 236 laboratories owned and/or funded by the 10 agencies that we were asked to survey. (See app. II for the list of laboratories.)

We surveyed the laboratories to obtain information about their fiscal year 1982 activities in implementing section 11, the latest available data at the time of our review. We received written responses from officials of all 236 laboratories. We conducted follow-up telephone interviews with laboratory officials to clarify and verify their responses. As requested by your offices, we conducted a follow-up visit to 14 of the 70 laboratories with annual budgets in excess of $20 million.

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[3]The requestors asked us to survey the Departments of Agriculture (USDA), Commerce (DOC), Defense (DOD), Energy (DOE), Health and Human Services (HHS), Interior (DOI), and Transportation (DOT) and the Environmental Protection Agency (EPA), the National Aeronautics and Space Administration (NASA), and the National Science Foundation (NSF).

[4]This work was jointly requested by Senator Charles McC. Mathias, Jr., Chairman, Subcommittee on Governmental Efficiency and the District of Columbia, Committee on Governmental Affairs; Representative George E. Brown, Jr., Chairman, Subcommittee on Departmental Operations, Research and Foreign Agriculture, Committee on Agriculture; and Representative Doug Walgren, Chairman, Subcommittee on Science, Research and Technology, Committee on Science and Technology, on December 8, 1981, and May 25, 1982.

This study was conducted from November 1982 to August 1983 in accordance with generally accepted government auditing standards.

AGENCIES' ACTIONS TO IMPLEMENT SECTION 11(b)

Section 11(b) of the act requires that:

--Each federal laboratory establish an Office of Research and Technology Applications (ORTA) or combine the ORTA with an existing organizational structure that performs technology transfer functions.

--Each federal laboratory with a total annual budget exceeding $20 million provide one full-time professional employee for the ORTA.

--Each agency which operates or directs one or more federal laboratories make available 0.5 percent of its R&D budget for technology transfer activities at the agency and laboratory level including the ORTA.

For the most part, we found that the federal agencies and their laboratories have taken action to implement Section 11(b) of the Stevenson-Wydler Act. For example, 81 percent of the federal laboratories we surveyed have established an ORTA either at the laboratory or headquarters levels. The 10 agencies we visited have either fulfilled or appropriately waived[5] the staffing requirement. In their annual reports to the Department of Commerce, all 10 agencies indicated that they spent more than 0.5 percent of their R&D budgets on technology transfer functions.

Most agencies either have established an ORTA at the laboratory level or have designated an equivalent organization at agency headquarters

The ORTA serves as the focal point for coordinating the technology transfer functions required by the act. We found that most agencies and laboratories have established an ORTA or designated an equivalent organizational unit as required by law.

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[5]An agency head may waive the staffing and/or funding requirements if he/she submits to the Congress, at the time the President submits the budget, an explanation of the reasons for the waiver and alternate plans for conducting the technology transfer function at the agency.

For example, table 1 shows that 190 (or 81 percent) of the 236 laboratories surveyed[6] are covered by an ORTA at the laboratory or headquarters levels.[7] In 105 of the 236 laboratories (or 45 percent), the ORTA or equivalent organizational structure is located at the laboratory level, while 85 (or 36 percent) of the laboratories are covered by ORTAs located at the headquarters level.

Table 1

Laboratories Covered by an ORTA

Agency	Total labs	Labs with ORTA or equivalent	Labs covered by agency ORTA	Total Labs covered by ORTA	Labs not covered by ORTA	Percent of labs covered by ORTA
DOD	75	50	3	53	22	71
NASA	8	8	0	8	0	100
NSF	5	1	0	1	4	20
DOE	39	27	0	27	12	69
DOT	7	2	5	7	0	100
EPA	14	1	13	14	0	100
USDA	16	3	13	16	0	100
DOC	45	4	41	45	0	100
HHS	4	3	0	3	1	75
DOI	23	6	10	16	7*	70
Total	236	105	85	190	46	
Percent	100	45	36	81	19	

*Of the seven DOI laboratories, five are under Fish and Wildlife Service (FWS) which, at the time of our study, was planning a reorganization. As part of this reorganization, an ORTA will be established at the agency level.

The remaining 46 laboratories (or 19 percent) are not covered by an ORTA. We asked the laboratories that are not covered by an ORTA to provide the reason(s) that an ORTA was not established. The reasons given for not establishing an ORTA include (1) personnel limitations, (2) uncertainty about agency policies on establishing an ORTA, and (3) technology transfer functions performed as a mission of another unit.

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[6]Appendix II is a list of the laboratories we surveyed.

[7]A headquarters level ORTA may not cover all laboratories in an agency. Usually it covers laboratories in a geographic region or laboratories with similar functions.

Agencies either have met the staffing requirements or have requested a waiver of the requirement

Laboratories with an annual budget exceeding $20 million are required to have at least one full-time staff person dedicated to technology transfer functions. However, the law permits agency heads to waive the staffing requirement if they submit to the Congress the reasons for the waiver and alternate plans for conducting the technology transfer functions. Four agencies--DOD, NASA, NSF, and DOE--waived the staffing requirement.

DOD gave the following three reasons for taking a waiver: (1) DOD's current technology transfer activity substantially achieves the objectives of the act, (2) the Department's R&D activities involve substantial classified efforts inappropriate for transfer, and (3) DOD's technology transfer activities are conducted differently, because of the variance in the size and complexity of the facilities throughout the DOD laboratory system. Therefore, the assignment of one full-time professional in each laboratory is impractical. As a result, DOD has directed its three services to individually establish mechanisms to implement the provisions of Stevenson-Wydler.

The basis for NASA's waiver is that NASA already has in place an alternate program to achieve the objectives of the act. The agency operates programs at NASA field centers,[8] staffed with technology utilization officers and staff, which provide technical assistance and disseminate information on technology to state and local governments and the private sector. NASA officials believe that without this waiver, NASA's response to the specific requirements of the act could result in duplication and unnecessary confusion of field center roles in technology innovation and could thus disrupt existing programs.

NSF waived the staffing requirement at its one laboratory with fiscal year 1982 funding exceeding $20 million, the National Center for Atmospheric Research (NCAR). Because of the special and limited research focus and management structure of this laboratory, NSF feels a team approach to technology transfer would be most efficient. Thus the Center will devote the equivalent of at least one full-time professional to its technology transfer activities, although no one person devotes full time to such activities.

DOE waived the staffing requirement for a select number of its laboratories because of their limited research focus and personnel limitations. These laboratories use a team approach to technology transfer with the equivalent of at least one full-time

[8]In NASA, "field centers" and laboratories are synonymous.

professional. DOE's team approach consists of a technology transfer coordinator who is supported by the laboratories' professional research personnel on an as-needed basis.

We found that all laboratories with fiscal year 1982 budgets greater than $20 million in agencies that did not waive the staffing requirement have a full-time professional in the ORTA. Although the legislation does not specify staffing requirements for laboratories funded under $20 million annually, we found that agencies are staffing these smaller laboratory ORTAs with at least one or more part-time professionals.

Agencies indicate they have met the 0.5 percent funding set-aside

The act requires each agency which operates or directs one or more laboratories to make available at least 0.5 percent of its R&D budget to support the technology transfer functions which were established by the act. We could not determine the precise figure spent in fiscal year 1982 for technology transfer activities because agencies do not account for such activities separately. The Department of Commerce gave us copies of each agency's first biennial reports required under section 11(e) of the act. These reports and information provided by agency officials indicate the agencies spent more than 0.5 percent of their fiscal year 1982 R&D budgets on technology transfer activities.

We also queried each laboratory about what proportion of its budget was spent on ORTA functions. We found that the laboratories in 6 of the 10 agencies estimated that they spent 0.5 percent or more of their total fiscal year 1982 laboratory budgets on the ORTA-related functions (table 2). Although total laboratory budget is not the same as total agency R&D budget, it does indicate that agencies are expending funds for technology transfer activities. [Note: Table 2 does not indicate an agency's total technology transfer efforts. It is in many instances substantially less than the total agency expenditure for technology transfer. This table shows expenditures only for the ORTA function at the laboratory. Therefore, it excludes expenditures for technology transfer functions by other than the ORTA. Because we could not determine the precise amount spent on technology transfer, the table was constructed to give an indication of the amount of the laboratories' budgets spent on the ORTA.]

Table 2
Laboratory Funding for ORTA
(FY 1982)

Agency	Total lab funding[a]	ORTA funding at labs[b]	Percent of total lab funding spent by the ORTA
DOD	$5,464,662,400	$ 2,922,500	.05
NASA	5,511,599,800	52,486,000	.95
NSF	39,184,000	2,500	.006
DOE	4,213,657,500	13,245,400	.31
DOT	89,900,000	4,800,000	5.34
EPA	6,100,000	18,000	.29
USDA	41,361,200	306,300	.74
DOC	197,905,700	10,589,000	5.35
HHS	3,958,375,800	21,091,300	.53
DOI	11,121,500	784,400	7.05
Total	$19,533,867,900	$106,245,400	.54

[a]Total lab funding includes facility operation and maintenance in addition to research, development, testing and evaluation (RDT&E).
[b]Headquarters ORTA funding not included.

AGENCIES' ACTIONS TO IMPLEMENT SECTION 11(c)

Section 11(c) of the act defines the technology transfer functions that the agencies and their laboratories are expected to perform. More specifically, section 11(c) requires the ORTA in each laboratory to:

1. Prepare an application assessment of each research and development project in which that laboratory is engaged which has potential for successful application in state or local government or in private industry.

2. Provide and disseminate information on federally owned or originated products, processes, and services having potential application to state and local governments and to private industry.

3. Provide technical assistance in response to requests from state and local government officials.

4. Cooperate with and assist the Center for the Utilization of Federal Technology (CUFT) and other organizations which link the research and research and development resources of that laboratory and the federal government as a whole to potential users in state and local government and private industry. (Because CUFT was just being established at the time of this survey, this report does not focus on this requirement of Section 11(c).)

Federal laboratories are conducting R&D application assessments

The act does not require all R&D projects to be assessed. Rather, an assessment is required only when an R&D project is determined to have potential for successful application in state and local governments or private industry. We asked the laboratories if they conduct R&D assessments on research projects to determine if there is potential for successful application in state and local governments or in private industry. According to questionnaire responses, about two-thirds of the laboratories performed assessments on at least some projects during fiscal year 1982. The major reasons cited by laboratory officials for not preparing application assessments were (1) the limited application of some research, (2) the early stage of certain research efforts, and (3) classified R&D projects. Table 3 shows the percent of laboratories which indicated that they conduct application assessments. As noted earlier, technology transfer activities may also be conducted by established organizational structures outside of agencies' federal laboratories. Therefore, table 3 may not reflect the total number of application assessments conducted by an agency.

Table 3

Percent of Laboratories Which Conduct R&D Application Assessments

Agency	Percent all labs	Percent ORTA labs	Percent non-ORTA labs
DOD	73	79	59
NASA	88	88	N/A[a]
NSF	40	100	25
DOE	62	78	25
DOT	57	57	N/A[a]
EPA	57	57	N/A[a]
USDA	81	81	N/A[a]
DOC	62	62	N/A[a]
HHS	100	100	100
DOI	70	81	43

[a]All laboratories at NASA, DOT, EPA, USDA, and DOC are covered by an ORTA or an equivalent existing organizational structure.

Information dissemination is the primary technology transfer activity in federal laboratories

Of the technology transfer functions (R&D assessment, information dissemination, and technical assistance) specified in the act, the laboratories reported that information dissemination was the primary technology transfer activity performed by the

ORTA. Over half of the laboratories' fiscal year 1982 ORTA funds were estimated to have been spent on information dissemination activities. Information is disseminated through media such as professional publications and journals, workshops with state and local governments, workshops with private industry, scientific meetings, news releases, and trade and popular publications.

Technical assistance to state and local governments varies greatly by agency

We asked the laboratories to estimate the total number of requests for technical assistance they received from state and local governments during fiscal year 1982. As table 4 shows, the number varied greatly by agency. One of the most important factors which contributed to this variance was the applicability of federal laboratory research to the needs of state and local governments. For example, 81 percent of all fiscal year 1982 requests for technical assistance were received by the Department of Agriculture. This may be attributed to the fact that USDA has for many years provided outreach services to state and local governments through its Federal-State Cooperative Extension Services and the State and Private Forestry System. On the other hand, requests for technical assistance at NASA may be low because such requests are handled through outside contractors; consequently, many requests to NASA for technical assistance are not handled by NASA laboratories.

Table 4

Number of Requests for Technical Assistance from State and Local Government

Agency	All labs	ORTA labs	Non-ORTA labs
DOD	1,237	1,221	16
NASA	205	205	N/A[a]
NSF	35	10	25
DOE	1,904	1,632	272
DOT	5,186	5,186	N/A[a]
EPA	3,761	3,761	N/A[a]
USDA	127,661	127,661	N/A[a]
DOC	4,293	4,293	N/A[a]
HHS	1,910	1,910	0
DOI	10,508	8,951	1,557
Total	156,700	154,830	1,870

[a]All laboratories at NASA, DOT, EPA, USDA, and DOC are covered by an ORTA or an equivalent existing organizational structure.

COMPARISON OF LABORATORIES WITH AND WITHOUT AN ORTA

In comparing the ORTA and non-ORTA laboratories (tables 3 and 4), we found that the laboratories with an ORTA have a much higher level of technology transfer activities. For example, a higher percentage of ORTA laboratories conduct R&D assessments on projects which have potential for successful application to state and local governments and private industry. In addition, the laboratories with ORTAs received almost all of the fiscal year 1982 requests for technical assistance.

However, the higher level of activity in the ORTA laboratories could be attributed to the fact that (1) the ORTA laboratories are generally larger and better funded than the laboratories without an ORTA and (2) the research results of the smaller non-ORTA laboratories may not be conducive to outside applications. Table 5 summarizes the differences in the profile of the ORTA and non-ORTA laboratories. As shown, we found that:

--The average funding and staffing of the non-ORTA laboratories are approximately half those of the ORTA laboratories.

--Compared to laboratories with an ORTA, those without an ORTA average only 18 percent of the number of research projects and 5 percent of the number of requests for technical assistance.

Table 5

Profile of 236 Federal Laboratories for Fiscal Year 1982

	ORTA (190)	Non-ORTA (46)
Average funding (millions)	$108	$48
Average staffing (scientists & technicians)	580	301
Average number of research projects	180	33
Average number of technical assistance requests	815	41

ISSUES WHICH MAY HAMPER TECHNOLOGY TRANSFER ACTIVITIES

Although most agencies in our survey have taken action to implement Section 11 of the Stevenson-Wydler Act, they identified two issues which may hamper technology transfer efforts: (1) lack of resources to provide technical assistance to state and local governments and (2) barriers created by existing federal patent policies.

Lack of resources to provide assistance to state and local governments

Section 11(c)(4) requires federal laboratories to provide technical assistance in response to requests from state and local governments. Officials at DOD, EPA, DOC, and DOI stated that technical assistance, for the most part, is not part of an agency's mission-related R&D work. The level and extent of technical assistance required depend upon the needs and skills of the user. These officials noted that state and local governments often have neither the scientific expertise nor the funds to perform the engineering changes necessary to apply federal technology to their needs. On the other hand, some federal laboratories do not have the funds or authority to perform the adaptive engineering necessary to make their technology adaptable to state and local needs.

Section 11(d)(5) of the Stevenson-Wydler Act gives the Department of Commerce's Center for Utilization of Federal Technology (CUFT) the responsibility for supplementing the 0.5 percent set-aside to agencies for technical assistance activities. At the time of our survey, CUFT was in its start-up phase. An agency official informed us that CUFT received $500,000 in funding for fiscal year 1983 and expected to receive $345,000 for fiscal year 1984. CUFT did not receive any appropriation funds in fiscal year 1982. This official stated that the fiscal year 1983 and 1984 funds may not be sufficient to provide the requested technical assistance.

Barriers created by existing federal patent policies

Officials at DOC and DOE and 15 percent of the federal laboratories in our survey indicated that patent/licensing policies may inhibit technology transfer. For example, DOC officials told us that some agencies have a policy of routinely applying for patents on all new research undertaken. Also, some agencies have a policy that they will not grant an exclusive license when more than one firm applies for a license. Without the right to exclusive licenses, firms may lack incentive to develop federally funded technologies.

APPENDIX I

In December 1980, President Carter signed the Patent and Trademark Amendment of 1980 (Public Law 96-517) which gives first preference in the exclusive or partially exclusive licensing of federally owned inventions to small business firms.

APPENDIX II

LIST OF LABORATORIES SURVEYED

•DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

- Western Regional Research Center
- Northern Regional Research Center
- National Animal Disease Center
- Southern Regional Research Center
- Beltsville Agricultural Research Center
- Plum Island Animal Disease Center
- Eastern Regional Research Center

FOREST SERVICE

- Intermountain Forest and Range Station
- Northcentral Forest Experiment Station
- Northeastern Forest Experiment Station
- Pacific Northwest Forest and Range Experiment Station
- Pacific Southwest Forest and Range Station
- Rocky Mountain Forest and Range Experiment Station
- Southwestern Forest Experiment Station
- Southern Forest Experiment Station
- Forest Products Laboratory

•DEPARTMENT OF COMMERCE

***NATIONAL BUREAU OF STANDARDS**

NATIONAL TELECOMMUNICATIONS AND INFORMATION ADMINISTRATION

- Institute for Telecommunication Sciences

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

- OTES/Engineering Development Office
- NOAA Data Buoy Office
- Hydrological Research Laboratory
- Geodetic Research and Development Laboratory
- Aeronomy Laboratory
- Air Resources Laboratories
- NOAA/Atlantic Oceanographic and Meteorological Laboratories

* Laboratories visited to clarify and verify questionnaire responses.

Geophysical Fluid Dynamics Laboratory
Great Lakes Environmental Research Laboratory
National Severe Storms Laboratory
Meteorological Laboratory
Atmospheric Turbulence and Diffusion Laboratory
Geophysical Monitoring for Climatic Change Program
National Hurricane Research Laboratory
Office of Weather Research and Modification
Pacific Marine Environmental Laboratory
Space Environmental Laboratory
Wave Propagation Laboratory
Earth Science Laboratory
Satellite Experiment Laboratory
Application Laboratory
Development Laboratory
Seattle Laboratory
Auke Bay Laboratory
National Marine Mammal Laboratory
Gloucester Laboratory
Milford Laboratory
Oxford Laboratory
Narragansett Laboratory
Woods Hole Laboratory
Sandy Hook Laboratory
La Jolla Laboratory
Tiburon Laboratory
Honolulu Laboratory
Pacific Environmental Group
Beaufort Laboratory
Charleston Laboratory
Miami Laboratory
Panama City Laboratory
Mississippi Laboratories
Galveston Laboratory
National Seafood Quality and Inspection Laboratory
Atlantic Environmental Group Narragansett Laboratory

***DEPARTMENT OF DEFENSE**

Armed Forces Radiobiology Research Institute

AIR FORCE

***U.S. Air Force Wright-Aeronautical Laboratories**
Aero-Propulsion Laboratory
Avionics Laboratory
Flight Dynamics Laboratory
Materials Laboratory

APPENDIX II

Air Force 6570th Aerospace Medical Research Laboratory
Air Force Armament Laboratory
Frank J. Seiler Research Laboratory
Geophysics Laboratory
Human Resources Laboratory
Rocket Propulsion Laboratory
Rome Air Development Center
USAF School of Aerospace Medicine
Air Force Weapons Laboratory
Air Force Engineering & Services Center/CC

ARMY

Walter Reed Army Institute
U.S. Army Research Institute of Environmental Medicine
U.S. Army Medical Bioengineering Research and Development Laboratory
Letterman Army Institute of Research
Institute of Surgical Research
U.S. Army Aeromedical Research Laboratory
Institute of Dental Research
U.S. Army Research Institute for the Behavioral and Social Sciences
U.S. Army Medical Research Institute of Chemical Defense
U.S. Army Engineering Topographic Laboratories
U.S. Army Waterways Experiment Station
U.S. Army Construction Engineering Research Laboratory
U.S. Army Cold Regions Research and Engineering Laboratory
U.S. Army Tank-Automotive Command Laboratories
***U.S. Army Natick Research and Development Laboratories**
U.S. Army Mobility Equipment Research and Development Command
U.S. Army Missile Laboratory
U.S. Army Materials and Mechanics Research Center
U.S. Army Human Engineering Laboratory
***Center for Communications Systems**
U.S. Army Armament R&D Command
Fire Control and Small Weapon Systems Laboratory
Ballistic Research Laboratory
Harry Diamond Laboratory
U.S. Army Signals Warfare Laboratory
U.S. Army Night Vision and Electro-Optics Laboratory

U.S. Army Electronic Warfare Laboratory
Combat Surveillance and Target Acquisition Laboratory
U.S. Army Atmospheric Sciences Laboratory
U.S. Army Aviation Research and Technology Laboratories
U.S. Army Avionics Research and Development Activity
Electronics Technology and Devices Laboratory
Coastal Engineering Research Center
U.S. Army Medical Research Institute of Infectious Diseases
Chemical Systems Laboratory

NAVY

Naval Research Laboratory
Naval Ocean Research and Development Activity
David W. Taylor Naval Ship Research and Development Center
Naval Air Development Center
Naval Coastal Systems Center
Naval Weapons Center
***Naval Underwater Systems Center**
Naval Explosive Ordnance Disposal Technology Center
***Naval Surface Weapons Center**
Naval Personnel Research and Development Center
Naval Oceans Systems Center
Naval Submarine Medical Research Laboratory
Naval Medical Research Institute
Naval Health Research Center
Naval Dental Research Institute
Naval Civil Engineering Laboratory
Naval Air Propulsion Center
Naval Aerospace Medical Research Laboratory
Naval Biosciences Laboratory
Naval Biodynamics Laboratory
Navy Clothing and Textile Research Facility
Naval Environmental Prediction Research Facility
Naval Air Engineering Center
Pacific Missile Test Center
Naval Avionics Center

***DEPARTMENT OF ENERGY**

Energy Technology Engineering Center
Lawrence Berkeley Laboratory
***Lawrence Livermore National Laboratory**
Stanford Linear Accelerator Facility

Laboratory for Energy-Related Health Research
Laboratory of Radiobiology and Environmental Health, LR 102
Laboratory of Biomedical and Environmental Sciences, UCLA
Solar Energy Research Institute
Idaho National Engineering Laboratory
***Argonne National Laboratory**
Carbondale Mining Technology Center
FERMI National Accelerator Laboratory
New Brunswick Laboratory - D/350
Notre Dame Radiation Laboratory
Ames Laboratory
Bates Linear Accelerator Facility
DOE Plant Research Laboratory
Pittsburgh Energy Technology Center
Princeton Plasma Physics Laboratory
Los Alamos National Laboratory
***Sandia National Laboratories**
Inhalation Toxicology Research Institute
Brookhaven National Laboratory
Environmental Measurements Laboratory
Knolls Atomic Power Laboratory
Biomedical Laboratory
Grand Forks Energy Technology Center
Bartlesville Energy Technology Center
Bettis Atomic Power Laboratory
Center for Energy and Environment Research
Savannah River Ecology Laboratory
Savannah River Laboratory
Oak Ridge Associated Universities
Oak Ridge National Laboratory
Radiobiology Laboratory
Hanford Engineering Development Laboratory
Pacific Northwest Laboratory
Morgantown Energy Technology Center
Laramie Energy Technology Center

•DEPARTMENT OF INTERIOR

BUREAU OF MINES

Albany Research Center
Avondale Research Center
Denver Research Center
Pittsburgh Research Center
Reno Research Center
Rolla Research Center
Salt Lake City Research Center
Spokane Research Center
Tuscaloosa Research Center
Twin Cities Research Center

BUREAU OF RECLAMATION

Engineering and Research Center

U.S. FISH AND WILDLIFE SERVICE

Northern Prairie Wildlife Research Center
Denver Wildlife Research Center
Patuxent Wildlife Research Center
National Wildlife Health Laboratory
Columbia National Fisheries Research Center
Great Lakes Fishery Laboratory
National Fisheries Research Center
National Fisheries Center-Leetown
National Fishery Research Laboratory
LaCrosse, WI
National Fishery Research Laboratory
Gainesville, FL
National Reservoir Research Program

U.S. GEOLOGICAL SURVEY

***DEPARTMENT OF TRANSPORTATION**

***Transportation Systems Center**
Civil Aero Medical Institute
FAA Technical Center
Fairbanks Highway Research Center
U.S. Coast Guard Research and Development
Center
Vehicle Research and Test Center
National Maritime Research Center

***ENVIRONMENTAL PROTECTION AGENCY**

Environmental Monitoring and Support
Laboratory, Cincinnati, OH
Industrial Environmental Research Laboratory,
Research Triangle Park, NC
Municipal Environmental Research Laboratory
Environmental Monitoring Systems Laboratory,
Research Triangle Park, NC
Environmental Sciences Research Laboratory
Health Effects Research Laboratory
Environmental Monitoring Systems Laboratory,
Las Vegas, NV
Environmental Research Laboratory
Athens, GA
Robert S. Kerr Environmental Research
Laboratory
Environmental Research Laboratory
Corvallis, OR
Environmental Research Laboratory
Narragansett, RI

Environmental Research Laboratory
Duluth, MN
Environmental Research Laboratory
Gulf Breeze, FL
Industrial Environmental Research
Laboratory, Cincinnati OH

•DEPARTMENT OF HEALTH AND HUMAN SERVICES

***ALCOHOL, DRUG ABUSE AND MENTAL HEALTH ADMINISTRATION**

CENTER FOR DISEASE CONTROL

FOOD AND DRUG ADMINISTRATION

NATIONAL INSTITUTES OF HEALTH

•NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

***Ames Research Center**
Goddard Space Flight Center
Lyndon B. Johnson Space Center
***Langley Research Center**
Lewis Research Center
George C. Marshall Space Flight Center
Jet Propulsion Laboratory
National Space Technology Laboratories

•NATIONAL SCIENCE FOUNDATION

Kitt Peak National Laboratory
National Astronomy & Ionosphere Center
National Radio Astronomy Observatory
Sacramento Peak Observatory
***National Center for Atmospheric Research**

APPENDIX III

U.S. GENERAL ACCOUNTING OFFICE
SURVEY OF FEDERAL LABORATORIES REGARDING
SECTION 11 OF THE STEVENSON-WYDLER TECHNOLOGY INNOVATION ACT OF 1980

INTRODUCTION

The purpose of this questionnaire is to obtain information from Federal laboratories about their technology transfer activities to assist GAO in its review of implementation of Sections 11(b) and (c) of the Stevenson-Wydler Technology Innovation Act of 1980 (Public Law 96-480). Responses to this questionnaire will help GAO review the current status of implementation and identify problems, if any, associated with implementation so that we may provide Congress with an overall perspective on what is being done to transfer federally owned or originated products, processes, and services having potential for successful application to State and local governments and to private industry.

This questionnaire should be completed by the laboratory director or his/her designee (an individual directly involved in the technology transfer functions of the laboratory).

Please answer all applicable questions and return the questionnaire within 5 days of receipt, if possible. A self-addressed business reply envelope is enclosed for your convenience. If you have any questions, please call Ms. Roberta Hale at (202) 275-3482.

Please enter below the name, title, and phone number of the individual who should be contacted in the event it is necessary to clarify any response or obtain additional information.

Name_____

Title_____

Phone_____

The return address for the questionnaire is:

Ms. Roberta A. Hale
U.S. General Accounting Office
Program Analysis Division
Science and Technology
441 G Street, NW, Room 6915
Washington, D. C. 20548

DEFINITIONS

To maintain a common understanding, please use the following definitions when answering the questions.

Laboratory - A facility whose primary purpose is the conduct of research and development in one or more research disciplines.

Research - A systematic, intensive study directed toward fuller scientific knowledge or understanding of the subject studies. Research is classified as either basic or applied.

Basic Research - A study where the primary concern is the gaining of a fuller knowledge or understanding of the subject under study.

Applied Research - A study where the primary concern is the practical use of the knowledge or understanding for the purpose of meeting a recognized need.

Out-of-House Work - Work performed outside your laboratory that is funded by your laboratory via contracts or grants.

In-House Work - Work carried out directly by personnel at the laboratory.

Research Projects - Discrete units of documented work with specific objectives and a designated timeframe for completion.

Technology Transfer Activities - As defined by Section 11(c) of the Stevenson-Wydler Act (see attachment).

>>> Note: For your convenience we have attached a copy of Section 11 of the Stevenson-Wydler Technology Innovation Act of 1980 to the back of this questionnaire.

APPENDIX III

BACKGROUND

1 (4)

1. What is the approximate dollar amount of your laboratory's total FY 1982 and proposed FY 1983 funding (include all sources of funds such as transfers and payments for services)? (Enter amount.)

FY 1982 funding $_____ (5-12)

FY 1983 funding $_____ (13-20)

2. Approximately what percentage of your laboratory's total FY 1982 and proposed FY 1983 funding is for in-house and out-of-house work? (Enter percent. If none, enter 0. See definitions for in-house and out-of-house work on page 1.)

	FY 1982	FY 1983	
1. In-House	___%	___%	(21-26)
2. Out-of-House	___%	___%	(27-32)
	100%	100%	

3. Approximately what percentage of your laboratory's FY 1982 and proposed FY 1983 funding for in-house work was (is) for work in each of the following areas? (Enter percent for each. If none, enter 0.)

	FY 1982	FY 1983	
1. Basic Research	___%	___%	(33-38)
2. Applied Research	___%	___%	(39-44)
3. Testing/Evaluation	___%	___%	(45-50)
4. Operations and Maintenance	___%	___%	(51-56)
5. Other (please specify)_____ _____	___%	___%	(57-62)
	100%	100%	

4. Approximately what percentage of your laboratory's FY 1982 and proposed FY 1983 funding for out-of-house work was (is) for work in each of the following areas? (Enter percent for each. If none, enter 0.)

	FY 1982	FY 1983	
1. Basic Research	___%	___%	(63-68)
2. Applied Research	___%	___%	(69-74)
3. Testing/Evaluation	___%	___%	(75-80)
4. Operation and Maintenance	___%	___%	(81-86)
5. Other (please specify)_____ _____	___%	___%	(87-92)
	100%	100%	

DUP 1-3
2 (4)

5. How many full-time equivalent employees does your laboratory have in each of the following categories? (Enter number for each. If none, enter 0.)

Category	Full-time Equivalent	
1. Scientists/Engineers	_____	(5-8)
2. Technicians (support and assist research Scientists/ Engineers)	_____	(9-12)

APPENDIX III

6. To what extent, if at all, are the research efforts of your laboratory actually used by each of the following user groups? (Check one.)

	1	2	3	4	5
1. Your department or agency					
2. Other Federal departments or agencies					
3. State & local governments					
4. Private industry/ Agriculture					
5. Nonprofit organizations and universities					
6. Foreign governments					
7. Other (please specify)					

AGENCY DIRECTIVES REGARDING STEVENSON-WYDLER

7. Has your laboratory received any instructions providing guidelines and directions on implementation of the Stevenson-Wydler Act from your department or agency? (Check one.)

(20)

1. [ ] Yes, written instructions received.

2. [ ] Yes, verbal instructions only.

3. [ ] No. >>> (If no, skip to 9.)

8. If you answered "yes, verbal instructions only" to No. 7, briefly explain.

9. Has your laboratory prepared any written policy or procedure statements regarding implementation of the provisions of the Stevenson-Wydler Technology Innovation Act? (Check one.)

(21)

1. [ ] No

2. [ ] Yes >>> Please attach a copy to this questionnaire.

OFFICE OF RESEARCH AND TECHNOLOGY APPLICATIONS

Stevenson-Wydler requires that each laboratory establish an Office of Research and Technology Applications (ORTA) or combine ORTA within an existing organizational structure at the laboratory which performs the functions of Section 11(c).

10. Does your laboratory have its own ORTA or an equivalent organizational structure which performs the functions of Section 11(c)? (Check one.)

(22)

1. [ ] Laboratory has own ORTA.

2. [ ] Laboratory has equivalent organizational structure which performs functions of Section 11(c).

3. [ ] Laboratory does not have ORTA or equivalent organizational structure. >>> (Skip to 12.)

11. Is there a functional statement for ORTA or equivalent organizational structure?

(23)

1. [ ] Yes. Please attach copy. >>> (Skip to 13.)

2. [ ] No. >>> (Skip to 13.)

>>> Note: For the remainder of this questionnaire "ORTA" refers to your laboratory's ORTA or equivalent organizational structure which performs the functions of Section 11(c).

APPENDIX III

12. How much of a reason, if any, was each of the following factors for your laboratory not establishing an ORTA? (Check one box for each factor.)

Factor	1	2	3	
1. Laboratory was directed by agency not to establish ORTA				(24)
2. Uncertain about agency policy on establishing ORTA				(25)
*3. Technology transfer functions are already routinely performed by scientists/engineers in the course of their research work				(26)
4. Technology transfer functions are performed as the mission of another unit within the agency				(27)
5. Personnel resource limitations				(28)
6. Type of funding (industrial fund, fee for service, etc.) did not permit establishment of ORTA				(29)
7. Other (please specify)				(30)

»» Note: If your laboratory does not have an ORTA and you answered Question 12, please skip to Question 17.

*[This response was deleted from data analysis because the legislation requires an ORTA.]

13. How many professional staff are currently assigned to work in your laboratory's ORTA? (Enter number. If none, enter 0.)

Number full-time _____ (31-34)

Number part-time _____ (35-38)

14. Please enter below the approximate dollar amount that was expended by your laboratory's ORTA for FY 1982 and the approximate dollar amount allocated for FY 1983. (Enter amount. If none, enter 0.)

1. Expended FY 1982 $_____ (39-46)

2. Allocated FY 1983 $_____ (47-54)

15. Does funding for your ORTA come from a specific technology transfer line item or from a general administrative line item in your laboratory's budget? (Check one.)

(55)

1. [ ] Specific technology transfer line item

2. [ ] General administrative line item

3. [ ] Other (please specify)_____

16. Approximately what percentage of your ORTA FY 1982 allocation was spent on each of the following functions as specifically defined by Section 11(c) (see attachment)? (Enter percent for each. If none, enter 0.)

Function

1. R&D assessments ___% (56-58)

2. Information dissemination ___% (59-61)

3. Technical assistance ___% (62-64)

4. Other (please specify)_____ ___% (65-67)

100%

APPENDIX III

APPLICATION ASSESSMENTS

Stevenson-Wydler states that it shall be the function of the ORTA to prepare an application assessment of each research and development project in which that laboratory is engaged which has potential for successful application in State or local governments or in private industry.

17. Approximately how many research projects (see definition on page 1) did your laboratory begin during FY 1982? (Enter number. Your best estimate will be sufficient.)

    Number of research projects _____ (68-71)

18. Does your laboratory conduct any R&D assessments on research projects to determine if there is potential for successful application in State or local governments or in private industry? (check one)

    (72)

    1. [ ] Yes

    2. [ ] No

19. If yes to Question 18, briefly describe R&D assessment process. Indicate when during the course of the research project assessments are made and what documentation if any, is developed as a result of the assessments.

20. For approximately what portion of the research projects started at your laboratory during FY 1982, has an application assessment that determines whether or not the project has potential for successful application to State or local governments or private industry been performed? (Check one.)

    (73)

    1. [ ] All or almost all

    2. [ ] Most

    3. [ ] About half

    4. [ ] Some

    5. [ ] None >>> (If none, skip to 22.)

21. Please indicate what portion of the research application assessments performed by your laboratory during FY 1982 were performed primarily by each of the following staff.

Type of Staff	Percent of Assessment
1. Scientist or researcher assigned to ORTA	___% (74-76)
2. Technical staff assigned to ORTA	___% (77-79)
3. Management staff assigned to ORTA	___% (80-82)
4. Scientist or researcher associated with project not assigned to ORTA	___% (83-85)
5. Management staff associated with project not assigned to ORTA	___% (86-88)
6. Technical staff associated with project not assigned to ORTA	___% (89-91)
7. Other (please specify) _____ _____	___% (92-94)
	100%

APPENDIX III

DUP 1-3
3 (4)

22. Consider those research projects started at your laboratory during FY 1982, that have not had an application assessment performed. For about what portion, if any, of these projects was each of the following factors a major reason why the application assessment has not been performed? (Check one for each.)

	1	2	3	4	5
1. Lack of resources (staff, funds) in research program areas					
2. Lack of resources in the ORTA					
3. National security					
4. Timing/stage of research (may be transferable eventually, too early to tell)					
5. Basic research					
6. Other(s) (please specify)					

23. How often, on the average are the researchers at your laboratory who are not assigned to an ORTA likely to provide information regarding federally owned or originated products, processes and services (having potential application) directly to private industry and/or State/local governments through each of the media listed below? (Check one for each.)

	1	2	3	4	5
1. Professional publications and journals					
2. Workshops with private industry					
3. Workshops with State and local governments					
4. Scientific meetings					
5. News releases, trade and popular publications					
6. Other(s) (Please specify)					

INFORMATION DISSEMINATION

Stevenson-Wydler states that it shall be the function of the ORTA to provide and disseminate information on federally owned or originated products, processes, and services having potential application to State and local governments and to private industry.

APPENDIX III

24. How often, if ever, are the staff assigned to the ORTA at your laboratory likely to provide information regarding federally owned or originated products, processes, and services having potential application to State and local governments or private industry through each of the media listed below? (Check one box for each. If your laboratory does not have an ORTA, skip to question 25.)

	1	2	3	4	5	
1. NTIS or other data information systems						(17)
2. Professional publications and journals						(18)
3. Workshops with private industry						(19)
4. Workshops with State governments						(20)
5. Scientific meetings						(21)
6. News releases, trade and popular publications						(22)
7. Other(s) (please specify)						(23)

TECHNICAL ASSISTANCE

Stevenson-Wydler states that it shall be the function of the ORTA to provide technical assistance in response to requests from State and local government officials.

25. During FY 1982 approximately how many formal and informal requests, if any, for technical assistance regarding federally owned or originated products, processes, and/or services did your laboratory receive from State and local governments? (Enter number. If none, enter 0. Your best estimate will be sufficient.)

Formal requests from State and local governments _____ (24-27)

Informal request from State and local governments _____ (28-31)

26. Please indicate approximately what percentage, if any, of the requests for technical assistance received by your laboratory from State and local governments during FY 1982 originated at each point of contact listed below. (Enter percentage for each. If none, enter 0.)

Point of Contact

1. Laboratory Administrative Office ___% (32-34)
2. Laboratory ORTA ___% (35-37)
3. Laboratory Public Information Office ___% (38-40)
4. Laboratory Program Staff ___% (41-43)
5. Other (please specify)

_____ ___% (44-46)

_____

100%

27. Approximately what percentage, if any, of requests for technical assistance your laboratory received from State and local governments during FY 1982 were formally tracked or monitored from receipt through disposition? (Enter number. If none, enter 0.)

Percentage requests for technical assistance formally tracked or monitored ___% (47-49)

APPENDIX III

28. Approximately what percentage of those requests received for technical assistance were disposed of in each of the following manners? (Enter percentage for each. If none, enter 0.)

1. ORTA staff provided assistance without program staff involvement ___% (50-52)

2. ORTA staff provided assistance in conjunction with program staff ___% (53-55)

3. Program staff provided assistance without involvement of any ORTA staff ___% (56-58)

4. Technical assistance not provided by laboratory. Requestor referred elsewhere by ORTA staff ___% (59-61)

5. Technical assistance not provided by laboratory. Requestor referred elsewhere by non-ORTA staff ___% (62-64)

6. Other(s) (please specify)
_____
_____ ___% (65-67)

100%

29. During FY 1982, approximately how many visits did staff from your laboratory make to State and local government locations to provide technical assistance concerning federally owned or originated processes, products, and/or services? (Enter number. If none, enter 0. Your best estimate will be sufficient.)

Number site visits to State/local governments _____ (68-70)

30. Approximately what percentage of the site visits made by your laboratory's staff were made under each of the conditions listed below? (Enter percent for each condition. If none, enter 0.)

1. Site visited by ORTA staff alone ___% (71-73)

2. Site visited by ORTA staff and program staff ___% (74-76)

3. Site visited by program staff alone (no ORTA staff) ___% (77-79)

100%

31. During FY 1982, did your laboratory have any joint projects with State and local governments for the purpose of providing technical assistance? (Check one for each.)

	1	2	
1. State governments			(80)
2. Local governments			(81)

32. If you answered yes for any of the organizations above, please provide a brief description of the joint project(s) and funding source(s).

33. During FY 1982, did your laboratory have any temporary personnel exchanges with State/local governments for the purpose of providing technical assistance? (Check one.)

(82)

1. [ ] Yes

2. [ ] No

34. If yes, please provide a brief description of the personnel exchanges.

APPENDIX III

General Technology Transfer Questions

35. In your opinion, approximately what portion, if any, of the research products, processes, or services produced by your laboratory do you feel currently has potential for successful application to State and local governments and/or to private industry? (Consider only those products, processes, or services which do not substantially compete with similar services available in the private sector.) (Check one.)

(83)

1. [ ] All or almost all currently have potential for successful application

2. [ ] Most currently have potential for successful application

3. [ ] About half have potential for successful application

4. [ ] Some have potential for successful application

5. [ ] Little or none have potential for successful application

36. Approximately what portion of the research products, processes, or services produced by your laboratory that you feel currently has potential for successful application to State and local governments and/or private industry have been made available? (Check one.)

(84)

1. [ ] All or almost all that is transferable is in fact made available.

2. [ ] Most that is transferable is in fact made available.

3. [ ] About half that is transferable is in fact made available.

4. [ ] Some that is transferable is in fact made available.

5. [ ] Little or none that is transferable is in fact made available.

APPENDIX III

37. Consider those research products, processes, and services produced by your laboratory that are in your opinion not made available for use by State/local governments and/or private industry. For approximately what portion, if any, of those products, processes, and services is each of the following factors a major reason why they are not available? (Check one.)

	1	2	3	4	5
1. National security					
2. Nature of product, process, or service (i.e., limited application)					
3. Stage of development (may be transferable eventually, too early to tell)					
4. Prohibitive costs incurred by laboratory for adaptive engineering					
5. Patent/license restrictions					
6. Other(s) (please specify)					

38. In your opinion, since passage of the Stevenson-Wydler Technology Innovation Act, has the level of technology transfer effort from your laboratory to State and local governments or private industry increased, decreased, or remained at about the same levels as before passage of the Act? (Check one for each.)

	1	2	3	4	5
1. State and local governments					
2. Private industry					

39. In your opinion, has the Stevenson-Wydler Act improved, worsened, or had no effect on your laboratory's ability to successfully carry out its research mission? (Check one.)

(93)

1. [ ] Greatly improved
2. [ ] Somewhat improved
3. [ ] No effect
4. [ ] Somewhat worsened
5. [ ] Greatly worsened

APPENDIX III

40. In your opinion, is the Stevenson-Wydler Act a workable mechanism to promote technology transfer from your laboratory to State/local government and/or private industry? (Check one for each.)

	1	2	3	4	5
1. State and local governments					
2. Private industry					

41. Briefly explain your response to question 40.

42. If you have any additional comments about the Stevenson-Wydler Technology Innovation Act or related issues, please enter them below. (Attach additional sheet(s) if you need more space.)

APPENDIX III

ATTACHMENT

STEVENSON-WYDLER TECHNOLOGY INNOVATION ACT

PUBLIC LAW 96-480---OCT. 21, 1980

SEC. 11. UTILIZATION OF FEDERAL TECHNOLOGY.

(a) POLICY.--It is the continuing responsibility of the Federal Government to ensure the full use of the results of the Nation's Federal investment in research and development. To this end the Federal Government shall strive where appropriate to transfer federally owned or originated technology to State and local governments and to the private sector.

(b) ESTABLISHMENT OF RESEARCH AND TECHNOLOGY APPLICATIONS OFFICES.--Each Federal laboratory shall establish an Office of Research and Technology Applications. Laboratories having existing organizational structures which perform the functions of this section may elect to combine the Office of Research and Technology Applications within the existing organization. The staffing and funding levels for these offices shall be determined between each Federal laboratory and the Federal agency operating or directing the laboratory, except that (1) each laboratory having a total annual budget exceeding $20,000,000 shall provide at least one professional individual full-time as staff for its Office of Research and Technology Applications, and (2) after September 30, 1981, each Federal agency which operates or directs one or more Federal laboratories shall make available not less than 0.5 percent of the agency's research and development budget to support the technology transfer function at the agency and at its laboratories, including support of the Offices of Research and Technology Applications. The agency head may waive the requirements set forth in (1) and/or (2) of this subsection. If the agency head waives either requirement (1) or (2), the agency head shall submit to Congress at the time the President submits the budget to Congress an explanation of the reasons for the waiver and alternate plans for conducting the technology transfer function at the agency.

(c) FUNCTIONS OF RESEARCH AND TECHNOLOGY APPLICATIONS OFFICES.-- It shall be the function of each Office of Research and Technology Applications--

(1) to prepare an application assessment of each research and development project in which that laboratory is engaged which has potential for successful application in State or local government or in private industry;

(2) to provide and disseminate information on federally owned or originated products, processes, and services having potential application to State and local governments and to private industry;

(3) to cooperate with and assist the Center for the Utilization of Federal Technology and other organizations which link the research and development resources of that laboratory and the Federal Government as a whole to potential users in State and local government and private industry; and

(4) to provide technical assistance in response to requests from State and local government officials.

Agencies which have established organizational structures outside their Federal laboratories which have as their principal purpose the transfer of federally owned or originated technology to State and local government and to the private sector may elect to perform the functions of this subsection in such organizational structures. No Office of Research and Technology Applications or other organizational structures performing the functions of this subsection shall substantially compete with similar services available in the private sector.

APPENDIX IV

National Aeronautics and
Space Administration

Washington D C
20546

Reply to Attn of LGS

MAY 4 1984

Mr. Frank C. Conahan
Director
National Security & International
Affairs Division
U.S. General Accounting Office
Washington, DC 20548

Dear Mr. Conahan:

We appreciate the opportunity to comment on the draft proposed report "Federal Agencies' Actions to Implement Section 11 of the Stevenson-Wydler Technology Innovation Act of 1980" (GAO/RCED-84-60).

From our perspective, Appendix I will better portray the NASA situation with the inclusion of the specific editorial changes enumerated in the Enclosure to this letter. These changes will more accurately place our laboratory activities in their proper context as elements of our overall agency program which includes significant use of organizations outside the laboratories. We ask that you consider changes to the text of the draft report letter, at the top of page 3, to allow for these corrections to Appendix I.

With respect to the secondary use of NASA technology, the two "issues" which are discussed both in the report letter and in Appendix I do not reflect our experience. "Technical assistance" as it is discussed is not a major factor or need in arranging for the use of NASA technology in either the public or private sectors. Patent licensing, as presented, is not relevant to NASA's situation, since we grant waivers or exclusive licenses in virtually all cases in which the applicant plans to commercialize the invention, with preference for the original inventor. Furthermore, patent waivers and licensing are involved only in approximately ten percent of the transfers of NASA technology into the non-aerospace community. The questionnaire gave each laboratory the opportunity to "check off" that topic as an issue. The fact that 85 percent did not do so may be as significant as the fact that 15 percent did. It might be worth noting which 15 percent of the laboratories find this topic to be an issue.

[GAO COMMENT: While "technical assistance" and "patent/licensing" may not be issues at NASA, 15 percent of the laboratories in our review said that these issues may hamper technology transfer. Officials at the Departments of Commerce, Defense, Interior, and EPA informed us of problems involved with providing technical assistance to state and local governments. Furthermore, the Department of Commerce in its report on Stevenson-Wydler, dated February 1984, and officials at DOC and DOE identified patent/licensing policies in some agencies as an inhibitor to technology transfer.]

We in NASA see yet another issue threatening the continued success of NASA's technology transfer efforts. There seems to be continuing and growing pressure to have just a few uniform systems and practices for the transfer of all kinds of Federal technology to an extremely diverse U.S. economy. Issues identified in a few agencies or lags in reaching a particular industry group seem to become the basis for proposals for government-wide remedial action regardless of what is already working in other sectors. Our successes have been rooted in a pragmatic, rather than a prescriptive, approach. As stressed in the entrance interview, one of the reasons our approach works as well as it does is because it includes "a genuine determination not to prescribe patent remedies for generalized, non-specific ailments." Likewise, it treats specific, localized ailments with localized, topical responses. Our ability to keep doing so is the issue we see as most crucial. We ask that you include this issue in both the report letter and Appendix I.

[GAO COMMENT: We did not interpret the intent of Stevenson-Wydler Act as threatening to any agencies' existing technology transfer efforts. The act clearly gives agencies options on how to operate and organize their technology transfer programs. More specifically, the act permits technology transfer functions to be performed by "existing organizational structures" such as NASA's Technology Utilization Office. We found NASA's program in full compliance with the act.]

Again, thank you for allowing us to make these comments.

John W. Boyd

John W. Boyd
Associate Administrator
for Management

Enclosure

NASA Comments on Draft GAO Report GAO/RCED-84-60

I. Corrections for Accuracy

1. Add a new Footnote to the list of ORTA functions (on page 1) of Appendix I: "Agencies may elect to perform any or all of the ORTA functions through organizational structures established outside their Federal laboratories."

[GAO COMMENT: We added a footnote to appendix I, page 1, to clarify the different types of technology transfer organizational structures permitted under the law.]

2. Footnote the NASA entry in Table 1 of Appendix I (page 4), as follows: "NASA does not have an ORTA, as such, and its laboratory technology utilization offices (TUOs) are not ORTAs nor their equivalents. They perform some of the ORTA functions, as do organizations outside the NASA laboratories. The TUOs are included in this table as ORTAs for convenience in data compilation."

[GAO COMMENT: We believe that the combination of NASA's Technology Utilization Offices and outside contractors fulfills the requirements of the Stevenson-Wydler Act. Section 11(b) of the act specifically gives agencies the option to perform technology transfer under "existing organizational structures" within the agency.]

3. Modify the discussion of the waiver (on page 5) in Appendix I to reflect the full extent of NASA's waiver: funding set-aside, as well as staffing. Our election to use organizations outside the laboratory is relevant to this discussion.

[GAO COMMENT: We did not modify our discussion on page 5 because footnote 5, appendix I, page 4, describes the full extent of the waiver clause in the act.]

4. Either add a footnote to Table 3 (on page 8) of Appendix I, or incorporate in the text which discusses that Table, the following: "In addition to the assessments performed at the NASA laboratories, all new technology from all NASA laboratories is the subject of evaluation for possible additional applications under organizations established outside the laboratories."

[GAO COMMENT: We added clarifying information to the text preceding table 3, appendix I.]

5. Footnote the text on Information dissemination (page 8) in Appendix I: "Information dissemination, in NASA's case, is not a transfer activity in and of itself, but is one element of every other transfer activity."

[GAO COMMENT: We agree with NASA that information dissemination is not a transfer activity in and of itself. However, section 11(c) of the act designates information dissemination as a primary function of the ORTA or its equivalent organizational structure. Our discussion on page 8 is intended to provide the Congress with an indication of how the agencies are performing this function of the act.]

6. Add to the text immediately ahead of Table 4 (page 9) of Appendix I: "The relatively few requests to NASA laboratories may be attributed to NASA's use of non-profit intermediaries and industrial firms as resources in translating NASA technology for state and local use."

[GAO COMMENT: We added to the text preceding table 4, appendix I, to include information on NASA's procedures to handle requests for technical assistance.]

II. Question of Meaning

NASA is not proposing a specific change to the discussion in Appendix I (bottom of page 11) of P.L. 96-517 and the Presidential Memorandum of Government Patent Policy dated February 18, 1983. However, our understanding of them differs from that which is presented in the report. That portion of P.L. 96-517 dealing with licensing of government-owned inventions (as distinguished from a contractor's first option to retain title to inventions made under a funding agreement) is not limited to small business firms, nor does the Presidential memorandum have anything to do with that licensing. Both P.L. 96-517 (specifically sections 207 and 208) and related Government-wide regulations allow agencies to grant exclusive or partially exclusive licenses as well as non-exclusive licenses. The procedures for doing so are spelled out in the regulations. Thus the general statement that licensing policies and procedures for Government-owned patents are a barrier to technology transfer does not, insofar as we can determine, extend to NASA-owned patents. We thought GAO might want the opportunity to clarify this matter.

Patrick G. Templeton

Patrick A. Templeton
Associate Administrator
for External Relations

[GAO COMMENT: We agree with NASA that the licensing provisions cited in sections 207 and 208 of Public Law 96-517 are not limited to small businesses and nonprofit organizations. While the Presidential memo does not address licensing, section 209 (C)(3) of Public Law 96-517 states that small businesses should receive first preference to exclusive or partially exclusive licenses of federally owned inventions.

APPENDIX V

NATIONAL SCIENCE FOUNDATION
WASHINGTON, D.C. 20550

OFFICE OF AUDIT
AND OVERSIGHT

April 18, 1984

Mr. J. Dexter Peach
Director
Resources, Community and
Economic Development Division
U. S. General Accounting Office
Washington, DC 20548

Dear Mr. Peach:

This is in response to your request for comments on the draft GAO report entitled, "Federal Agencies' Actions to Implement Section 11 of the Stevenson-Wydler Technology Innovation Act of 1980". In general, we feel that your staff has done a good job. However, we do suggest the following.

Table 1 indicates that only one of the five NSF-supported laboratories is covered by an ORTA or equivalent. This probably is a result of some confusion in interpreting your questionnaire. All five are in compliance with the Act; the other four having assigned the ORTA function to existing units.

Table 2 indicates that for NSF 0.006% of the laboratory funding is spent directly by the ORTA. This is correct but misleading. As noted in the draft report the NSF-supported laboratories have used a distributed, rather than a centralized approach because of the nature of the research being done. Accordingly, at NCAR 3.98% of the total funding is devoted to technology transfer. A similar situation exists at the other NSF-supported laboratories.

On page 11 of the draft, there is a discussion of the lack of resources to provide assistance to others because of lack of funds or authority. This section might note that there is little incentive

for a laboratory to seek funds for this purpose if the result would be a reduced emphasis on the functions directly related to the laboratory's reason for existence.

We appreciate the opportunity to comment on the draft report.

Sincerely yours,

Jerome H. Fregeau
Director
Office of Audit & Oversight

cc: Dr. Knapp, Director, NSF

[GAO COMMENT: NSF comments state that its laboratories were confused about interpreting the GAO questionnaire they received. In a subsequent telephone call, an NSF official stated that four of its laboratories interpreted the ORTA function to be pertinent only to laboratories with a budget greater than $20 million. We were specifically requested to survey the laboratories' efforts to implement the Stevenson-Wydler Act. We did not change table 1 (appendix I, p. 4) because we believe it accurately reflects the status of implementation at the laboratories at the time of our survey.

NSF, as well as other agencies, points out that appendix I, table 2, does not reflect the totality of agency technology transfer efforts. We added clarifying information to the text preceding table 2. We also modified column headings and added footnotes to further clarify that the information presented in table 2 pertains only to the agencies' laboratories that had an ORTA or equivalent organizational structure located at the laboratory.]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 20 [redacted]

OFFICE OF
POLICY, PLANNING AND EVALUATION

Mr. J. Dexter Peach
Director
Resources, Community and
Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

This letter provides the Environmental Protection Agency's (EPA's) response to the General Accounting Office's (GAO's) draft report, "Federal Agencies' Actions to Implement Section 11 of the Stevenson-Wydler Technology Innovation Act of 1980" (GAO/RCED-84-60). This response fulfills the Agency's obligation under P.L. 96-226.

We realize that GAO's data in the report has been compiled from information obtained from the individual laboratories through the questionnaire GAO circulated and collected in 1982. We would, however, like to make the following statements for clarification:

page 4 - All 14 laboratories are covered by an Agency Office of Research and Technology Application (ORTA), as defined by the Act. No laboratory has its own individual ORTA.

page 7 - Total Office of Research and Development funding for FY 1982 was $205.7 million (obligations) and total ORTA funding was approximately $390,000. (The laboratory portion is not broken down.)

page 8 - With respect to the reasons for not preparing application assessments, a note was attached to our original submission December 20, 1982, as follows: "Formal procedures are not in place, however, potential for application in States and local governments and private industry is taken into account in the justification for continued involvement. We have no documentation at this time." All of our laboratories, with the help of the Regional Services Staff of ORTA, are now involved in this effort.

page 9 - Table 4 incorrectly lists the total number of technical assistance requests for EPA during FY 1982. Approximately 1,900 (400 formal and 1,500 informal) requests for technical assistance from State and local governments were received.

In Appendix II, GAO may wish to differentiate between the two EPA Industrial Environmental Research Laboratories (Research Triangle Park, NC, and Cincinnati, OH) and the three EPA Environmental Monitoring and Support Laboratories (Las Vegas, NV; Cincinnati, OH; and Research Triangle Park, NC).

We appreciate the opportunity to comment on the draft report before its publication. Hopefully, these comments correct any misunderstandings that might have resulted from the responses your office received previously.

Sincerely yours,

Milton Russell
Assistant Administrator
for Policy, Planning and Evaluation

[GAO COMMENT: EPA comments point out some differences in the statistics which where reported to us by their laboratories and the statistics available at EPA's headquarters. All of the numerical statistics in this report are based on information from the federal laboratories rather than from the agency headquarters. The requestors of the study specifically asked that we obtain the laboratories' perspective on the implementation of the act.

We did not change our statistics because the differences may reflect the difference between the status of implementation at the time of our survey and the present.]

APPENDIX VII

THE UNDER SECRETARY OF DEFENSE

WASHINGTON D.C. 20301

RESEARCH AND
ENGINEERING

17 MAY 1984

(R&AT)

Mr. Frank C. Conahan
Director
National Security and International
Affairs Division
United States General Accounting Office
Washington, D.C. 20548

Dear Mr. Conahan:

In reponse to your letter of March 22, 1984 concerning "Federal Agencies Actions To Implement Section 11 of the Stevenson-Wydler Technology Innovation Act", our comments to your draft report are attached.

It is gratifying to learn that the Federal Agencies have taken action to implement the requirements of the Act. The Department of Defense (DoD) considers that the current scope and size of DoD technical information and technology transfer are re extensive than those required in the Act, and it is DoD intention to continue vigorous support of these activities in the future.

Sincerely,

James P. Wade, Jr.

James P. Wade, Jr.
Principal Deputy Under Secretary of
Defense for Research & Engineering

Attachment

GAO DRAFT REPORT DATED MARCH 22, 1984
(GAO CODE NO. 974188 - OSD CASE NO. 6478)

"FEDERAL AGENCIES" ACTIONS TO IMPLEMENT SECTION 11 OF THE STEVENSON-WYDLER TECHNOLOGY INNOVATION ACT OF 1980"

FINDINGS AND DOD COMMENTS

- FINDING A. Agencies Have Taken Some Action To Implement Section 11. GAO found that for the most part, federal agencies and their laboratories have taken action to implement Section 11 of the Stevenson-Wydler Act. This Act requires

  - each applicable federal agency to establish an Office of Research and Technology Applications (ORTA);

  - each federal laboratory in such an agency to establish an ORTA or designate a component to perform technology transfer;

  - each covered federal laboratory to assign one full-time professional to the ORTA; and

  - each covered agency to make available 0.5 percent of the R&D budget for technology transfer activities at the agency or laboratory level.

  DOD COMMENT. DoD concurs. In fulfilling the requirements of PL 96-480, the DoD waived the full-time and monetary set-aside requirements for the Military Services, but directed them to individually establish mechanisms to comply with the law, including establishment of Offices of Research and Technology Applications (ORTAs).

- FINDING B. 81 Percent of Federal and 71 Percent of DoD Laboratories Have ORTA. GAO found that 190 of 236 laboratories surveyed at 10 agencies (81 percent) are covered by an ORTA at either the lab or agency level. For DoD, GAO found that of 75 laboratories surveyed 50 have a laboratory ORTA or equivalent, and 3 are covered by an agency ORTA, for a total of 71 percent with ORTA coverage.

  DOD COMMENT. DoD concurs. The figures cited may reflect the status of laboratory ORTAs at the time that the survey was taken, but currently, all DoD laboratories have an ORTA or equivalent. The Navy has established an ORTA at 15 of their laboratories, and the remaining 10 have a technology transfer/PL 96-480 contact point (ORTA equivalent). The Army identified 35 Army laboratories as requiring ORTAs, and has directed each of them to establish such a function. The Air Force has an ORTA or equivalent at each of their 15 laboratories.

- FINDING C. All Surveyed Labs with $20 Million Budgets Have Full-Time ORTA Staff or Have Requested a Waiver. GAO found that all 70 of the laboratories surveyed which have budgets in excess of $20 million either have a full-time ORTA staff or have requested a waiver of this provision.

  DOD COMMENT. DoD concurs.

- FINDING D. DoD and Three Other Agencies Have Waived ORTA Staffing. Noting that Section 11 permits agencies to waive the ORTA staffing requirement if they submit to Congress reasons for waiver and alternate technology transfer plans, GAO found that DoD and three other agencies have utilized the waiver provision. DoD gave GAO these three reasons for taking the waiver:

  - that DoD's current technology transfer substantially achieve the act's objectives;
  - that DoD R&D involves substantial classified effort inappropriate for transfer; and
  - that DoD's transfer activities take a different form from that contemplated by the act because of the variation in size and complexity of its R&D facilities. As a result of this variation, GAO found, DoD has directed the three services individually to establish mechanisms to implement the act.

  DOD COMMENT. DoD concurs.

- FINDING E. All Agencies Surveyed Spent Statutory Minimum On Technology Transfer. GAO found that all of the agencies surveyed indicated they had spent more than 0.5 percent of their FY 1982 R&D budgets (the Sec. 11 minimum) on technology transfer functions, but GAO could not determine precise amounts spent on technology transfer because agencies do not account for this activity separately. GAO also found that laboratories themselves in 6 of 10 agencies surveyed indicated they spent 0.5 percent of more of their laboratory R&D budgets on ORTA functions.

  DOD COMMENT. DoD concurs. Table 2, Appendix I, page 7 of the draft GAO report has the potential for being misinterpreted as being related to the law's required 0.5 percent of R&D funding to be used for technology transfer. Column 1 of the table should be annotated to indicate that more than RDT&E funds are included, and column 3 should be annotated to explain that it does not reflect the total funding for technology transfer efforts of the laboratories.

[GAO COMMENT: Although DOD concurs with finding E, DOD recommended some changes to avoid misinterpretation.

We added clarifying information to the text preceding table 2 (appendix I, p. 6). We also modified column headings and added footnotes to further clarify that the information presented in Table 2 estimates only expenditures for technology transfer by ORTAs located at the laboratories. Therefore, it may not indicate total agency expenditures nor total laboratory expenditures for technology transfer.]

- FINDING F. Information Dissemination Is Primary ORTA Function. GAO found that dissemination of technological information was the primary function being performed by the ORTA staffs, and that over half the FY 1982 funds available to laboratory ORTAs were spent on this function.

  DOD COMMENT. DoD concurs.

- FINDING G. Laboratories With ORTA Show Higher Level of Technology Transfer Activity. GAO found that federal laboratories covered by an ORTA show a much higher level of technology transfer activity than labs without ORTA. GAO attributed this to the fact that labs with ORTAs have more resources than those without and that the research results of smaller, non-ORTA labs may not be conducive to outside applications.

  DOD COMMENT. DoD concurs.

- FINDING H. Lack of Resources and Patent Barriers May Hamper Technology Transfer. GAO found that a lack of resources, both in federal laboratories for transfer activities, and in State and local governments for adaptive engineering, may hamper technology transfer efforts. GAO also found that some federal officials believe federal patent and licensing policies are barriers to the transfer of federally developed technology to the private sector.

  DOD COMMENT. DoD concurs. DoD considers that the current scope and size of DoD technical information and technology transfer activities are more extensive than those required in the Act, and it is DoD intention to continue vigorous support of these activities in the future.

APPENDIX VIII

Department of Energy
Washington, D.C. 20585

APR 24 1984

Mr. J. Dexter Peach
Director
Resources, Community and Economic
Development Division
General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

The Department of Energy (DOE) appreciates the opportunity to review and comment on the GAO draft report entitled "Federal Agencies' Actions To Implement Section 11 Of The Stevenson-Wydler Technology Innovation Act of 1980." The Department has no disagreement with the basic findings of the report.

For clarification, we would like to note that in regard to the Office of Research and Technology Applications (ORTA) function there is a distinctive difference between the major DOE laboratories which conduct large-scale research programs and the much smaller research activities conducted within a university department setting. In a separate letter, I am sending suggested editorial changes to the draft report which should clarify this difference.

The Department recognizes that patent policy is an important contributor to technology transfer effectiveness. The Department has already granted class waivers to Government patent rights to organizations who contract for fully funded Research and Development (R&D) at the DOE laboratories (work-for-others) and to organizations conducting research at the laboratories' designated user facilities. The Department is currently addressing the issues related to additional class waivers to patent rights which would cover much of the Government-funded R&D at the laboratories.

The Department appreciates the opportunity to comment on this draft report, and trusts that GAO will consider the comments including the suggested editorial changes in preparing the final report.

Sincerely,

Martha O. Hesse
Assistant Secretary
Management and Administration

APPENDIX VIII

Department of Energy
Washington, D.C. 20585

APR 24 1984

Mr. Franklin Frazier
Resources, Community and Economic
Development Division
General Accounting Office
Washington, D.C. 20548

Dear Mr. Frazier:

In response to Mr. J. Dexter Peach's request of March 21, 1984, the Department of Energy's formal comments on the General Accounting Office (GAO) draft report entitled "Federal Agencies' Actions To Implement Section 11 of the Stevenson-Wydler Technology Innovation Act of 1980" are being prepared and will be submitted by separate letter to the GAO.

Editorial comments on this report are enclosed for GAO's consideration in preparing the final report.

Sincerely,

Martha O. Hesse
Assistant Secretary
Management and Administration

Enclosure

1. Appendix I, Page 4

Table 1
Laboratories Covered by an ORTA

Agency	Total labs	Labs with ORTA or equivalent	Labs covered by agency ORTA	Total Labs covered by ORTA	Labs not covered by ORTA	Percent of labs covered by ORTA
DOD	75	50	3	53	22	71
NASA	8	8	0	8	0	100
NSF	5	1	0	1	4	20
DOE	39	27	0	27	12	69
DOT	7	2	5	7	0	100
EPA	14	1	13	14	0	100
USDA	16	3	13	16	0	100
DOC	45	4	41	45	0	100
HHS	4	3	0	3	1	75
DOI	23	6	10	16	7*	70
Total	236	105	85	190	46	
Percent	100	45	36	81	19	

Comment - We suggest a footnote to the DOE entry, "laboratories not covered by ORTA," on table 1 which states the following:

> These twelve DOE laboratories are mostly small physical research or biomedical research activities which are essentially contained within a department of a university. As such, these laboratories do not have the organizational identity necessary to establish a full ORTA office, but do have an ORTA function (point of contact) and are required to prepare application assessments of projects which have technology transfer potential.

[GAO COMMENT: DOE suggested that we footnote table I, appendix I, to indicate that DOE laboratories which were not covered by an ORTA function are small and are generally located at universities.

These smaller laboratories, however, are not exempt from the requirements of the Stevenson-Wydler Act. The act recognizes the limited resources in smaller laboratories by not requiring that a full-time professional staff ORTAs at laboratories with a budget of less than $20 million. It appears that DOE is complying with the spirit of the law by having an ORTA function (point of contact) at these smaller laboratories as well as by performing the application assessment for potential technology transfer.

We believe that table I, appendix I, accurately reflects the status of DOE laboratories' efforts to implement the Stevenson-Wydler Act at the time of our survey.]

APPENDIX IX

UNITED STATES DEPARTMENT OF COMMERCE
The Assistant Secretary for Administration
Washington, D.C 20230

MAY 02 1984

Mr. J. Dexter Peach
Director, Resources, Community, and
Economic Development Division
United States General
Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

This is in reply to GAO's letter of March 21, 1984, requesting comments on the draft report entitled Federal Agencies' Actions To Implement Section 11 of the Stevenson-Wydler Technology Innovation Act of 1980, (GAO/RCED-84-60).

We have reviewed the enclosed comments of the Under Secretary for Economic Affairs and believe they are responsive to the matters discussed in the report.

Sincerely,

Kay Bulow

Kay Bulow
Deputy Assistant Secretary
for Administration

Enclosure

APPENDIX IX

UNITED STATES DEPARTMENT OF COMMERCE
The Under Secretary for Economic Affairs
Washington, D.C. 20230

2 MAY 1984

Mr. J. Dexter Peach
Director, Resources, Community, and
Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

We have reviewed the U.S. General Accounting Office's draft report entitled "Federal Agencies' Actions to Implement Section 11 of the Steven-Wydler Technology Innovation Act of 1980."

The Department of Commerce, in accordance with the requirements of section 5(d) of the Stevenson-Wydler Act, recently prepared and submitted to the President and the Congress a report on implementation of the Act (copy enclosed). The report supports your draft report's conclusion that some existing Federal patent/licensing policies and procedures are hampering Federal laboratory technology transfer efforts.

Regarding the need to change Federal patent policy, the report states that the Administration rather than continuing the process of "warehousing" Federally-funded inventions developed by Government contractors and later licensing them, already has adopted a patent policy of "automatically" transferring ownership of inventions to the organizations that developed them and that have the expertise and incentive to commercialize them.

This policy was furthered on February 18, 1983, when the President signed a memorandum directing Federal agencies to extend the policy of contractor ownership of inventions that Pub. L. No. 96-517 established for small business and nonprofit organizations to all research and development contractors. This extension is a major step in ensuring that Government-funded technology is available to the private sector for commercial use. In most cases, the inventing contractor is most likely to have the knowledge and motivation to commercialize the new technology.

Because the statutes of a few agencies restrict the implementation of this policy to some degree, our report recommends that legislation be enacted to remove these last barriers to a uniform Government patent policy. The Administration is supporting the enactment of such legislation.

Regarding Federal licensing policies, our report recognizes that patent licensing is the type of intellectual property transfer most used at the Federal agency level as a private sector incentive for development of Federal laboratory inventions. This is done primarily on a centralized basis, either by the patent staffs at

agency headquarters or by the Center for Utilization of Federal Technology which is part of the Department of Commerce's National Technical Information Service and which has a Government-wide patent licensing function.

The report states that successful promotion of some inventions may require the resources of centralized licensing organizations with access to potential nationwide and international users. For example, centralized licensing offices would be able to target advertising of specific technologies for the Stevenson-Wydler Act Offices of Research and Technology Applications (ORTAs) (which could handle other aspects of the transfer), as well as provide advice and training to the staffs of the ORTAs.

The report notes that some agencies have misinterpreted Pub. L. No. 96-517 as requiring nonexclusive licensing if more than one firm applies for a license. This is not the case and the report implicitly recommends that these agencies amend their procedures accordingly.

The report also notes that centralized licensing offices tend to concentrate on inventions that meet a known commercial need and are the easiest to sell. These offices may do less well than decentralized operations at the laboratory level in becoming advocates and market creators for technologies that were not developed to meet a specific private sector need or that are more suitable for development by start-up companies.

ORTAs and licensing offices that are decentralized have natural advantages for some types of technology transfer because of their immediate proximity to the laboratories. Laboratory research could be more effectively transferred to industry by "full service" ORTAs performing the following functions:

- Identifying, evaluating, and arranging for the protection of new technologies.
- Promoting commercial use of the new technologies produced by the laboratory that may lead to new business ventures.
- Coordinating with the ORTAs of other laboratories, when necessary, to meet the needs of industry for Federal technologies from more than one source.
- Recommending research to meet market needs.
- Seeking venture capital to help start-up ventures.
- Entering into collaborative research projects with industry, including limited partnerships.

- Administering policies that encourage employee-inventor start-ups and follow-on participation.

- Administering a royalty sharing program with laboratory inventors and with any part of the laboratory deemed to have contributed to the invention that generates the royalties.

- Training and instructing on invention, entrepreneurship and industrial innovation.

- Assessing and advising on potential conflicts of interest.

- Granting patent licenses or assigning future invention ownership rights as an incentive for industry cooperation in developing, participating in, or contributing resources for further laboratory research efforts.

The report notes that the present authorities of most ORTAs are limited and unclear and that, with respect to patent policy and licensing, the Department of Commerce, to the extent that ORTAs may lack such authorities, is considering whether and by what means to augment their authorities to:

- Negotiate the assignment or licensing of Government-owned inventions.

- Negotiate arrangements that include disposition of future research results on an exclusive basis, acceptance of private sector funding, and formation of Government/private sector research teams.

- Administer incentives to Federal employee inventors, including royalty sharing and the right of employees to own inventions that neither the Government nor a participating private sector organization plans to commercialize.

- Arrange (with appropriate limits) for Federal employee inventors to participate in the future development of an invention outside of the lab when this is necessary for successful commercialization.

The report states that, in addition, it may be useful to establish a system of organizational incentives that encourages the laboratories to support technology transfer and commercialization. One element could be retention by the laboratory, for future research purposes, of part of the royalties. Care must be exercised to ensure that budgetary controls are not weakened and that a proper balance is maintained between Federal research missions and commercialization efforts.

The report also recommends that techniques be developed and made available to the ORTAs to help evaluate the commercial potential of new technologies. Such techniques are particularly necessary to evaluate ideas that were not developed to meet a known private sector need.

Implementation of our report's recommendations also could result in more efficient use of resources assigned to technology transfer efforts. The recommendations, therefore, also address the concern expressed in your draft report that technology transfer is hampered by a lack of resources.

Comments from the Office of Research and Technology Applications of the National Oceanic and Atmospheric Administration are enclosed. Thank you for this opportunity to comment.

Sincerely,

Sidney L. Jones
Under Secretary for
Economic Affairs

Enclosures

[NOAA's] Comments on Proposed Report on Implementation of the Stevenson-Wydler Technology Innovation Act

We have reviewed the subject report and NOAA has no substantative comments on its generalizations concerning the actions of Federal agencies in implementing the Stevenson-Wydler Act. We should point out however, that there appears to be disproportionate NOAA input to the GAO survey. Appendix II of the report lists the 236 "laboratories" surveyed and 43 of them were in NOAA. This represents over 18 percent of the total Federal response and 95 percent of the DOC response (a total of 45 DOC laboratories are listed).

The problem, no doubt, is the result of the timing of the survey relative to the status of our implementation of P.L. 96-480. We initiated our program in April 1982, conducted a pilot assessment survey of our laboratories that year, and established a central NOAA ORTA in January 1983. The GAO questionaire was sent to each NOAA R&D activity rather than to the NOAA ORTA as was done for other agencies with centralized ORTA's (e.g., National Bureau of Standards).

There are other problems with the GAO integration of information from the ten agencies and their laboratories surveyed. To list a few of the more obvious:

(1) diversity in R&D mission responsibility;

(2) disparity in the size of the laboratories (in both staffing and budget);

(3) difference between agencies in assigning ORTA functions (laboratories, components, agency headquarters);

(4) lack of guidelines for responding to the GAO survey in view of the above.

To the extent that the report describes agency actions in implementing P.L. 96-480, we think it is reasonably accurate; however, we question the representativeness and information value of the tabular information presented in Appendex I.

[GAO COMMENT: DOC, with the exception of comments from NOAA, concurs with our report. DOC's comments amplify the problems with patent and licensing policies which are expressed in the report. DOC's comments also summarize its report to the President and the Congress on the Stevenson-Wydler Act.

NOAA commented that its laboratories represented a disproportionate input to the GAO survey and that the draft report integrated information from laboratories with dissimilar characteristics.

We surveyed the universe of federal R&D laboratories in the 10 agencies in this review. Therefore, we made no attempt to stratify a sample of laboratories by size, mission, or organizational characteristics. Each agency assisted us in developing its list of laboratories. For example, DOC told us it regarded NBS as one laboratory while it regarded each NOAA facility as an individual laboratory.]

DEPARTMENT OF HEALTH & HUMAN SERVICES Office of Inspector General

APR 20 1984

Mr. Richard L. Fogel
Director, Human Resources
Division
United States General
Accounting Office
Washington, D.C. 20548

Dear Mr. Fogel:

The Secretary asked that I respond to your request for the Department's comments on your draft report "Federal Agencies' Implement Section II of the Stevenson-Wydler Technology Innovation Act of 1980." The enclosed comments represent the tentative position of the Department and are subject to reevaluation when the final version of this report is received.

We appreciate the opportunity to comment on this draft report before its publication.

Sincerely yours,

For Richard P. Kusserow
Inspector General

Enclosure

APPENDIX X

COMMENTS OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES ON THE GENERAL ACCOUNTING OFFICE'S DRAFT REPORT, "FEDERAL AGENCIES' ACTIONS TO IMPLEMENT SECTION 11 OF THE STEVENSON-WYDLER TECHNOLOGY INNOVATION ACT OF 1980"

We concur with the general tone of the report suggesting that Federal laboratories are in compliance with the requirements of the Act and with Section 11 in particular. During the period of the survey, the Public Health Service was in the midst of analyzing the requirements of the Act, preparing the first report submitted to the Department of Commerce in compliance with the Act, and designating Offices of Research and Technology Applications (ORTA). Therefore, it was possible that one of the PHS laboratories was not covered by an agency ORTA as indicated in Table 1 of Appendix 1, at the time the survey was prepared. Currently, all of our four laboratories have designated Offices of Research and Technology Applications.

[GAO COMMENT: HHS stated that one of its laboratories may not have designated an ORTA because during the time of our survey, the agency was in the process of responding to the requirements of the act. HHS stated that all of the laboratories are now covered by an ORTA.

We did not change table I of appendix I to show that all HHS laboratories are covered by an ORTA. To change table I of appendix I, GAO would have to verify the ORTA's existence at the laboratory. We believe that table I of appendix I accurately reflects the level of compliance at the time of our survey.]

APPENDIX XI

U.S. Department of Transportation

Assistant Secretary for Administration

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Mr. J. Dexter Peach
Director, Resources, Community and Economic Development Division
U.S. General Accounting Office
Washington, D. C. 20548

Dear Mr. Peach:

This is in response to your letter requesting Department of Transportation (DOT) comments on the General Accounting Office (GAO) draft report, "Federal Agencies' Actions to Implement Section 11 of the Stevenson-Wydler Technology Innovation Act," dated March 21, 1984.

GAO found that most of the agencies and their laboratories have taken action to implement the requirements of the Act. GAO also found that patent policies and lack of resources to perform technical assistance may hamper technology transfer efforts.

DOT concurs with the contents and conclusions of this draft report. We understand, from discussion with your staff that the Transportation Test Center, Pueblo, Colorado and the Shipboard Fire and Safety Facility, Mobile, Alabama, were deleted from the list because they are test and evaluation facilities while this survey deals only with research and development facilities.

We would like to note that the first sentence of the last paragraph, page 11, Appendix I, should continue after "small business firms" to include "and non-profit organizations (including universities)."

If we can be of further assistance, please let us know.

Sincerely,

Robert L. Fairman

[GAO COMMENT: DOT concurs with our report. However, DOT noted, that in addition to small businesses, "non-profit organizations (including universities)" are given first preference in the exclusive or partially exclusive licensing of federally owned inventions under the Patent and Trademark Amendment of 1980 (Public Law 96-517). However, we disagree with DOT's comment; section 209(c)(3) of the law specifically states that "first preference in the exclusive or partially exclusive licensing [not title] of federally owned inventions should go to small business firms ***" (emphasis added).

APPENDIX XII

United States Department of Agriculture

Agricultural Research Service

Administrative Management Office of the Deputy Administrator

Beltsville, Maryland 20705

SUBJECT: GAO Draft Report RCED-84-60, Dated March 22, 1984, Entitled "Federal Agencies' Actions to Implement Section 11 of the Stevenson-Wydler Technology Innovation Act"

TO: J. Dexter Peach, Director
Resources, Community, and Economic Development Division, GAO

THROUGH: Orville G. Bentley, Assistant Secretary
Science and Education

Stephen B. Dewhurst, Director
Office of Budget and Program Analysis

The United States Department of Agriculture concurs with the subject draft report as submitted.

Arthur H. Nies

ARTHUR H. NIES
Deputy Administrator

cc:
Donn E. Adkisson, OIG

APPENDIX XIII

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

APR 19 1984

Mr. J. Dexter Peach
Director, Resources, Community and
Economic Development Division
U.S. General Accounting Office
Washington, D.C. 20548

Dear Mr. Peach:

We appreciate having had the opportunity to review GAO's proposed report to the Congress entitled "Federal Agencies' Actions to Implement Section 11 of the Stevenson-Wydler Technology Innovation Act" (GAO/RCED-84-60).

Since it represents the results of a survey conducted among laboratories owned and/or funded by four organizations of this Department, we have no comments on the report.

Sincerely,

Joseph E. Doddridge

Deputy Assistant Secretary -
Policy, Budget and Administration

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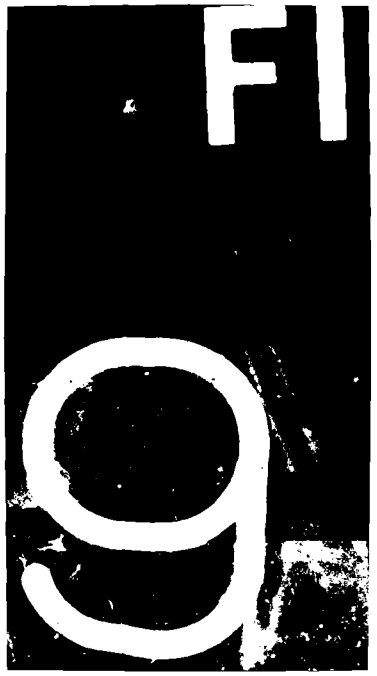
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